

W6IFE San Bernardino Microwave Society Newsletter

W6IFE Newsletter

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The 1 **October 1998** meeting of the SBMS will have Doug, K6JEY talk about

basic spectrum analyzer operation. The SBMS meets at the American Legion

Hall 1024 Main Street (south of the 91 freeway in Corona, CA at 1930 hours

local time on the first Thursday of each month..

Last meeting Bill, WA6QYR covered some operating aids for the field. Ideas

of having a list of pointing angles from the planned site to other popular

sites in the area; for full duplex operating such as with gunnplexers on 10

GHz one can use the boomerang to give a signal return that allows the

operator to check his rig performance (and make adjustments for improvement

like setting the feed in the dish focus); the use of two compass rose on a

sheet of paper to set the angle of a non-moveable compass rose on your tripod to a known direction (like on of the beacons) and then know the reading needed for any other direction from the tripod. Thanks Bill for the ideas. Visitors were Peter Lyman, K6PTL of Pasadena; Mike Danford, KD6FAM of Romoland; John Stephensen, KD6OZH of Brentwood; and Gary Becda, K6ENS of Redondo Beach. New member present was Mel Swanberg, WA6JBD of Riverside.

Welcome to all. It was voted to reply to the ARRL context rules committee request for feelings on changes to the 10 GHz contest. The membership would like to see operation from 6 pm Friday through 6 p.m. Sunday. They would also like to open the contest to all microwave bands 2.3 GHz and up with scoring per band and possibly an overall winner. Frank, WB6CWN will be responding to the ARRL request. K6OW noted that the church next door will be having Thursday night meetings now. SBMS should be aware of parking in front of meeting hall and not spill over into the side or back streets where cars have been broken into. 34 people present.

It is with sadness that we report the passing of microwaver and great guy, Lloyd Novak, AB6SM. Lloyd is a member of long standing in SBMS and Cactus. Lloyd was always out in the field with his microwave gear even if it had problems. An example to all of us to keep doing our best. We wish his family well. errata- I goofed on the date of the Miller High School (Fontana) swap meet.

It is the second weekend in the month. Thanks George for keeping me straight.

Wants and Gots for sale

Want Siemens 10 GHz TWT power supply Frank WB6CWN 805-443-2902 fk@event1.com.

Want WR-42 waveguide switch Dave WA6CGR 909-612-5888.

Scheduling

5 Nov. meeting tech talk TBD.

3 Dec. meeting tech talk TBD.

7 Jan 99 meeting tech talk TBD.

4 Feb. meeting tech talk TBD.

Activity reported at the September meeting: Dick, WB6DNX was out on Heaps PK for the 1st weekend of the contest; Paul, N6LL was out for a few contest contacts before his rig broke; Chip, N6CA was out on contest and helped set up the WSWSS web page; Al, K6LJM was out fixing ATV equipment on Heaps; Gary W6KVC did some ATV work; Jim, K6ML was out for a few 10 GHz WBFM contacts ; Gordon, WB6YLI operated from home and collected 3K points, and is building the WA6EXV waterpipe feed; Larry, K6HLH now has a 2w 10 GHz amp; Ed, W6OYJ was out to the ARRL SW convention then did some contesting on 10 and 24 GHz; Mel, WA6JBD got some 24 GHz contacts; Doug, K6JEY brought in his new 24 GHz rig to show and was out for the contest; Dave WA6CGR is back in SOCAL , had his 24 GHz SSB rig to show, and had 30 Q's in the contest; Eric, KD6GLP had one contact with his new rig in the contest; John, KD6OZH worked the contest; Joe, WA6PAZ did a tech talk at the West Coast ARC and was out for contest; Gary, K6ENS had 13 contacts on the contest; Dave, WB6OVZ had a MACOM transverter to work with; Derek, KN6TD is building parts; Bob, W6SYA heard the PV beacon on his new narrowband 10 GHz rig and had 10 and 24 GHz WBFM contacts; Bob, K6ITU is building a 10 GHz rig; Frank, WB6CWN is rebuilding his TWT supply; Bill, WA6QYR finished the 1.2 and 2.3 GHz loop yagis, modified the Qualcomm 1152 MHz synthesizer board, checked out the mixer RFI mods to his 24 GHz rig and did some roving to find more sites for the 2nd contest weekend; Chuck, WA6EXV roved during the contest, but too much water in air for long 24 GHz contacts, had a few 10 GHz contacts, rebuilt his TWT into a better box for 10 GHz EME operation; Phil, W6HCC sold his Cherry Valley house and is finishing his move to Colorado (going to miss you Phil); Dave, K6OW did a tech talk at SW ARRL convention (some 30 NEW people to his beginning microwave talk- GREAT)and was out for contest; Robin, WA6CDR did a tech talk at convention and was out for the contest.

Comments from folks on various sites during the 2nd weekend of the 10 GHz and Up contest:

Here are a few words on the operation at 6000 ft Heaps Peak DM14kf on the second weekend of the 10 GHz Cumulative Contest for 1998. I arrived at Heaps Peak early Friday evening and unloaded most of the equipment needed for the contest. Saturday morning I awoke early (there is not much to do at Heaps in the evening, so I went to bed much earlier than usual) and after a great breakfast I set up the equipment and made some checks on its performance, then waited for the contest to begin. At 0818 I made my first contact with WA6QYR/6 and then proceeded to make 29 more over the weekend. This was not a very productive contest for me!

Shortly after the contest started, I received a call from Gary, K6ENS on the liaison channel stating that he was at the Heaps Peak gate and was having trouble finding the correct lock to open (there are a zillion locks on that gate!). Gary arrived on site in a short while and began to set up his equipment. The two of us continued to work stations through out the day. Gary said that he had several locations that he would like to work from in the LA area the next day, so departed Heaps Peak when the contest ended on Saturday.

About mid morning on Saturday, the wave guide relay on my 35 Watt TWT decided to get very sluggish and finally totally quit. I was then forced to install my one Watt PA and continue the contest. What a bummer! I was not able to work Bill and Mel (WA6QYR) in the San Joaquin Valley after that.

Conditions were not very good, as I was not able to hear most of the Northern California stations which I have heard on many other occasions.

Early Sunday morning, Dick, WB6DNX joined me on Heaps Peak and set up his equipment. Conditions looked even more bleak this morning, a very strong inversion hung over the LA basin and did not break up all day. In fact by mid afternoon we were completely engulfed in fog, to the point that we were

not able to see the tops of most of the towers on Heaps Peak. The highlight of the day came when Dick was attempting to work Robin, WA6CDR/XE2 and Jack, N6XQ/XE2. The normal bounce path off Palos Verdes DM03ts to Mexico (DM11pr) was not working at all and Dick was just barely hearing signals from them, but not able to make copy. I then suggested to Dick that he point his antenna up into one of the towers and see if they were reflecting the signals. I had done this on earlier occasions when working the San Diego group. This time it worked great and Dick was able to work both of the stations with his antenna pointed about 40 degrees up! This took place late in the day and it was bitter cold with dense fog, I thought that Dick's hand would freeze up at any moment and the key would be locked down, but he persevered. By 1830 most of the other stations had closed down and it became so cold at Heaps Peak that Dick and I decided to pack it in and left the hill. 73, Chuck WA6EXV

During the contest, the first 24 GHz narrowband contact in Southern California occurred the evening of September 19th at 19:58 PST in Hesperia, CA. between Dave Glawson - WA6CGR and John Stephensen - KD6OZH within the same grid square - DM14HK. This was witnessed by David Gill - KE6FYF of Hesperia.

The following day, the first 24 GHz narrowband contact between Northern and Southern California. Dave Glawson - WA6CGR on Frazier Mountain (DM04MS) and Brian Yee - W6BY on Music Mountain (DM07IB) established communication on 24.192102 GHz at a distance of 160 Miles (257 km)!. The signals were 30 dB over S-9 on both ends. This was witnessed by Joe Saddler - WA6PAZ. Also from Frazier Mountain (DM04MS) WA6CGR worked KD6OZH at DM05KL at 49 miles (80 km). The signals were 5 and 9.

The radio used by WA6CGR is running 120 mW output and an approximate 3 dB noise figure on the receiver. The system is phase locked to within +/- 1 KHz @ 24.192000000 GHz using the WA6CGR phase lock system.

I don't have any details on Brian's radio. Dave - WA6CGR

I had expected Saturday to be a warm up for Sunday, but I lost a fuel pump in Ventura on the way to Santa Ynez Sunday morning. Missed working Bill.

Rats. I worked some guys and made some points. Frank-WB6CWN

16 stations were on the air in the San Francisco Bay Area and Northern California during the 1998 10 GHz and Up contest, including a lost soul from Southern California. Being GREAT hosts that we are, Dave K6OW was allowed to have the best distance at 889 km working XE2/N6XQ and XE2/WA6CDR at DM11PR from Mt. Vaca CM88wj. Second best distance was our local DX'r Ron K6GZA at 875 km from Mt. Tamalpais CM87qw also to DM11PR. W6ASL had a great year...Jim did not run over GZA's dish during teardown, and finally heard Jack and Robin in DM11 with S7 bursts. ASL is mailing SWL cards to both.

im-W6ASL

When Jack and I arrived at Punta Banda (Baja, Mexico DM11pr) Friday night, the wx was cloud cover down on the deck- fog. we set up anyway, except for the dishes because it was blowing- Saturday morning, we finished the setup, drying off the stuff that got wet- my LO PLL wouldn't lock until I stuck 2 150W floodlamps onto it for 20 minutes or so, after letting it all air out for an hour- I did cover it with a tarp the night before, but that wasn't enough, apparently..... after that, it behaved normally.

I went to Mexico expecting it to be HOT!- I took the Gazebo that I use on Mt. Wilson, and other sun protection stuff- I like cold weather, but that was COLD!- wet gloppy fog until 10-11 on Saturday, then cleared for a while, but it never got really warm.. Jack says it was my fault- I took a gazebo for sun protection. so it rained (or at least fogged!). Murphy Lives!! I thought conditions were poor on Saturday with signals from NorCal poor to

missing and only moderate beacon strength- like s9 or so, with Frazier louder than PV.. but- Sunday!!! GAWK!!! The Frazier beacon was threshold the entire day, and PV was essentially missing the whole day- I think I detected it a little in the morning, but most of the rest of the day it was gone- Jack could just detect it on his better rx, but absolutely amazingly BAD! Signals from Heaps were best when they pointed at the towers and we pointed direct path! worked on it for quite a while to work WB6DNX on Sunday- his signals were weak bouncing off the towers, but were NOT THERE bouncing off PV! Signals from LA stations were barely SSB, and sometimes CW only on Sunday. Jack and I were truly amazed that there was any path to NorCal at all on Sunday- working K6OW at Vaca CM88wj was really tuff, but it happened. K6OW commented that he was very surprised that the known path from Vaca to Heaps didn't work- the dense cloud cover and no inversion killed it, I guess. Anyway- 3 longest paths were to K6GZA on Mt. Tam, 875 KM; K6OW on Crystal 836 KM and K6OW on Vaca, 889 KM; and the next 5 longest qsos were with WA6QYR, 557 KM, 580 KM, 646 KM, 666 KM, 622 KM. 21 qsos on Saturday, 14 qsos on Sunday for 35 qsos from XE- 73 robin- WA6CDR/XE2

The plan of this rover was to hit 23 sites in the California Central Valley and get a bunch of points. I had Mel, WA6JBD for copilot and helper. The pickup was loaded with gear and towed a trailer with the 4 ft dish. We arrived in Tulare on Friday afternoon and found a starting location. By Saturday morning Murphy had hit. I was sick and at the throw-up threshold. We traveled to the first site and set up, but signals just weren't propagating. The TWT decided to start blowing fuzes and not wanting to reset. We only managed to make 4 sites on Saturday and 6 on Sunday. With a total of 32 contacts from 11 calls, things just didn't work out as great as the plan. It paid off to have the CMOS Super Keyer 3 to work all those CW

contacts at the noise level. While sitting next to a cotton field near Los Banos, a deputy sheriff stopped by asking if we were out cloning cell phones. You sure get a lot of strange looks when out in the agricultural areas with a 4 ft dish on a trailer and a pickup with a GPS dome and other antennas. Thanks to all those stations on Northern and Southern California mountain tops for providing contacts. Thanks to Mel for being a great helper. I think we have a new microwaver in Mel. Special thanks to Jack, N6XQ and Robin, WA6CDR for traveling to Mexico for some long distance contacts and to Dave, K6OW who visited various Northern California peaks and provided lots of contacts. EVERYONE- SEND IN YOUR SCORES AND LOGS FOR THE CONTEST, EVEN IF YOU ONLY HAD ONE CONTACT.

Bill, WA6QYR

A Test tool: The Boomerang

If you are looking for a simple tool for checking the operation of your full duplex (receive and transmit at the same time) microwave system, i.e. the old ROCKLOC(Relative Or Crystal Local Oscillator Control) rig or one of its later generation WBFM rig, the boomerang will do the job. The boomerang is just a simple crystal oscillator running at your IF frequency, 30 MHz, that is connected to a detector on a waveguide of the correct frequency band. Say for the current folk running the 10 GHz gunnplexer, this would be a 30 MHz crystal oscillator in a metal box with say a 9 volt battery. The output of the oscillator is feed through a piece of coax to a WR90 waveguide detector mount. The open waveguide end is pointed at your gunnplexer. The 10 GHz energy from the gunnplexer enters the waveguide and mixes with the 30 MHz driving the 1N23 diode. Now you have your 10 GHz transmit frequency plus and minus 30 MHz and harmonics coming back out of the waveguide toward your gunnplexer. Instant second station to hear in your WBFM receiver. Now you can put the boomerang on a fence post and adjust the gunnplexer position at

the focus of the dish. See how far you can hear the boomerang. See if adding the 30 MHz preamp to the gunnplexer IF output improved the performance of the rig. Since the boomerang depends upon the amount of power your gunn puts out, the distance heard is related to transmit power and sensitivity of the receiver circuits, --system performance.

With the ROCKLOC rig using the polarplexer feed, the transmitter was put into one port of a circular waveguide transition and the receive energy was taking out at an orthogonal port 90 degrees away. We transmitted on say 45 degrees to the right of the propagation path and received 45 degrees to the left. Placing the boomerang in transmission path with either vertical or horizontal polarization, enough energy to be captured by diode and re-radiated so one could check station performance. Making polaplexers out of coffee cans on 2 GHz, steel beer cans on 3.3 GHz and brass toilet tank fittings for 10 GHz was easy. Now in the aluminum pop can days one has to shop the supermarket closer to find materials to build antennas with.

Pointing helps.

With all the polluted air these days and ability to work stations beyond line of sight on the microwave bands, one needs tools to find where to point for that other station out there. Enter the Boy Scout compass and the computer. One you know where you are either by the GPS device in you pocket or looking on a topographic map/ AAA map with the latitude/ longitude marked in the margin. You can enter that data into the basic program BD (bearing/distance) found on the ARRL webpages or from a friend and come up with the Maidenhead grid square you are standing in. Some GPS devices read out in Maidenhead coordinates. Learning what grid the other station is in will allow you to punch in to BD that grid square and read out what the distance and heading to the station is from your position. Now all you need to do is figure out what direction that is. Now you pull out the magnetic compass and read the heading- right? No the magnetic compass points to

magnetic north which in most cases is not the same as true north. In Southern California magnetic north is about 15 degrees to the east of true north. So you need to subtract 15 degrees from the true heading and find that magnetic heading on the compass rose. In other parts of the country you may need to add or subtract a different amount, so one may wish to consult the data on the bottom of your topographic map or a Boy Scout Handbook. Now holding the compass level and still, allowing the needle to rotate freely and settle to magnetic north, you now position your eye to look over the center of the compass to the heading degrees and spot some object on the horizon in the heading direction. Now you can point your dish toward that object and connect up with the other station. Once contact is made you can log the contact, grid squares, and write down the distance from BD. Planning in advance as to what hill top you are going to and the locations of other good sites, one can make up a list of pointing angles for that site so in the next contest you'll know exactly where to point for those rovers. Some does and don'ts for compass use might be in order. Since a compass uses magnetic fields to point, standing next to a metal car may effect your compass. Don't lay the compass and your map on the car hood and expect it to point correctly. This goes for the picnic table with metal bolts too. The data on your computer disks may not like the magnetic compass needle. In other words keep the compass away from metal and magnets. I know one Boy Scout who liked magnets and his compass. Placing both in the same pocket resulted in a compass whose needle would point south.

Some microwavers pick up military surplus tripods and other devices for holding up a dish antenna. Some of these support devices have a compass rose mounted on them. Some of the compass roses are adjustable, rotate in azimuth and can be locked with a set screw. On others the reading just rotates with the dish and no way to reset it. A tool to help finding a azimuth direction with the non-adjustable compass rose is to build a translator. If one draws

on paper a circle and using a protractor marks off a compass rose of 360 degrees, this can serve as the ground heading desired. If you make a second smaller diameter compass rose that would fit inside the first, now you have a compass rose that represents the one on your tripod. Cut out the smaller circle from the paper and place it over the center of the ground larger circle. Use a small screw or tack to hold the two circles in place while allowing the smaller one to rotate. Now say you are on a hill and have a beacon in a known direction you can receive. Peak up on the beacon signal and note the reading on the tripod compass rose. Take the tripod reading on the inner paper compass rose and align it to the correct heading on the outer ground compass rose. Now you have a translator for where you would like to point to from your location to the heading you should set on the tripod compass rose. If you don't have a known beacon direction to point to, you can use a magnetic compass to find say an east object on the horizon to position your dish optical alignment tool on. And now you can read the tripod heading. If you want to keep everything in true readings, then you will have to convert the east magnetic heading to true heading. Some of the military compass roses read in a clockwise direction around the device and others read counterclockwise. So when laying out your inner circle take that into account. Some military (usually Army equipment) compass roses read in mils, 6400 mils per 360 degrees. This is fine, you just need to make 6400 divisions around your inner rose instead of 360. So you have a degrees to mils translator.

Bill WA6QYR



Above is Dave Glawson, WA6CGR showing off some of his microwave rigs in about 1996.

73s Bill

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